We claim:

1. A method for assaying angiogenesis *ex vivo*, said method comprising the steps of:

(a) embedding a three-dimensional mammalian tissue sample in a matrix, wherein the tissue sample has at least one cut surface exposing blood vessels;

(b) supplying to the embedded tissue sample a medium that supports the growth of the tissue sample;

(c) incubating the embedded tissue sample in the medium for a time sufficient to allow angiogenic vessels, if any, to grow into the matrix surrounding the tissue sample; and

(d) observing or measuring the angiogenic vessels, if any, that grow into the matrix surrounding the tissue sample.

2. A method as recited in Claim 1, wherein the medium comprises a serum-free medium that supports the growth of the tissue sample; wherein the medium contains substantially no exogenous angiogenesis-enhancing factors and substantially no exogenous angiogenesis-suppressing factors.

3. A method as recited in Claim 1, wherein the medium comprises serum.

4. A method as recited in Claim 1, wherein the medium comprises an angiogenesis-enhancing factor.

5. A method as recited in Claim 4, wherein the angiogenesis-enhancing factor is selected from the group consisting of platelet-derived growth factor, vascular endothelial growth factor, epidermal growth factor, fibroblast growth factor, and transforming growth factor β.

6. A method as recited in Claim 1, wherein the matrix comprises fibrin.

7. A method as recited in Claim 1, wherein the matrix comprises collagen.

8. A method as recited in Claim 1, wherein the matrix comprises gelatin.

9. A method as recited in Claim 1, wherein the matrix comprises agarose, agar, alginate, or silica gel.

10. A method as recited in Claim 1, wherein the matrix comprises Matrigel.

11. A method as recited in Claim 1, wherein the tissue sample is a tumor fragment.

12. A method as recited in Claim 1, wherein the tissue sample is not a tumor fragment, and wherein the tissue sample is not an isolated segment of an artery or vein.

13. A method as recited in Claim 1, additionally comprising the step of supplying an additional factor to the embedded tissue sample, and measuring the difference in angiogenesis for the tissue sample as compared to the angiogenesis of an otherwise identical and otherwise identically-treated control tissue sample that is not supplied with the factor; whereby the difference in observed angiogenesis is a measure of the angiogenic enhancement or angiogenic suppression characteristics of the supplied factor.

14. A method for growing a tissue *ex vivo*, said method comprising the steps of:

(a) embedding a three-dimensional mammalian tissue sample in a matrix, wherein the tissue sample has at least one cut surface exposing blood vessels;

(b) supplying to the embedded tissue sample a medium that supports the growth of the tissue sample; and

(c) incubating the embedded tissue sample in the medium for a time sufficient to allow angiogenic vessels to grow into the matrix surrounding the tissue sample; and to allow the number of cells in the tissue to proliferate, so that the tissue's suitability for transplant is improved.

15. A method as recited in Claim 14, wherein the medium comprises serum.

16. A method as recited in Claim 14, wherein the medium comprises an angiogenesis-enhancing factor.

17. A method as recited in Claim 16, wherein the angiogenesis-enhancing factor is selected from the group consisting of platelet-derived growth factor, vascular endothelial growth factor, epidermal growth factor, fibroblast growth factor, and transforming growth factor β.

18. A method as recited in Claim 14, wherein the matrix comprises fibrin.

19. A method as recited in Claim 14, wherein the matrix comprises collagen.

20. A method as recited in Claim 14, wherein the matrix comprises gelatin.

21. A method as recited in Claim 14, wherein the matrix comprises agarose, agar, alginate, or silica gel.

22. A method as recited in Claim 14, wherein the matrix comprises Matrigel.

23. A method as recited in Claim 14, wherein the tissue sample is selected from the group consisting of skin tissue, parathyroid tissue, thyroid tissue, pituitary tissue, adrenal tissue, pancreas tissue, cardiac muscle tissue, skeletal muscle tissue, retina tissue, kidney tissue, liver tissue, and prostate tissue.

24. A method as recited in Claim 14, additionally comprising the subsequent step of transplanting the incubated embedded tissue sample with angiogenic vessels into a host in need of such a transplant.

25. A method as recited in Claim 14, wherein said incubating step is conducted for a time sufficient for the mass of the tissue to increase by at least about 25%.

26. A method as recited in Claim 25, additionally comprising the subsequent step of transplanting the incubated embedded tissue sample with angiogenic vessels into a host in need of such a transplant.

27. A tissue with angiogenic vessels produced by the method of Claim 14.

28. A tissue with angiogenic vessels produced by the method of Claim 15.

29. A tissue with angiogenic vessels produced by the method of Claim 16.

30. A tissue with angiogenic vessels produced by the method of Claim 17.

1 **31.** A tissue with angiogenic vessels produced by the method of Claim 18.

1 **32.** A tissue with angiogenic vessels produced by the method of Claim 19.

1 **33.** A tissue with angiogenic vessels produced by the method of Claim 20.

1 **34.** A tissue with angiogenic vessels produced by the method of Claim 21.

1 **35.** A tissue with angiogenic vessels produced by the method of Claim 22.

1 **36.** A tissue with angiogenic vessels produced by the method of Claim 23.

1 **37.** A tissue with angiogenic vessels produced by the method of Claim 25.